ABSTRACT

In an electronic inductor circuit, an operational amplifier drives the base of the electronic inductor transistor, and receives negative feedback from the emitter of the transistor. The transistor and operational amplifier combine to form a voltage-controlled current source (VCCS) with respect to the loop current. A voltage divider connected across the rectified Tip and Ring voltage (or another node of the circuit at an equivalent voltage) provides a DC reference to the positive input of the operational amplifier, so that the line current automatically increases with an increase in line voltage. A capacitor couples the transmit signal driver to the positive input of the operational amplifier. This electronic inductor circuit can be driven using a low voltage supply and provides sufficient linearity for high-speed modem applications.